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Keeping you informed of the latest ISS technology

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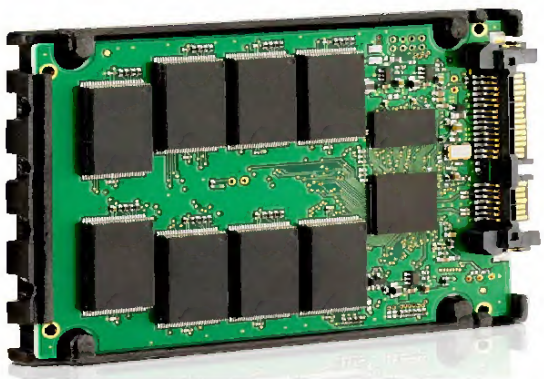
HP Solid State Drive technology

Overview

HP solid stote drives (SSDs) hove no moving ports, which mokes them oble to operote in more extreme environments thon troditionol hord disk drives. Avoiloble in 32-GB or 64-GB versions from HP, these first generotion drives ore designed specificolly for ProLiont c-Closs server blodes.

Figure 1-1. HP Solid State Drive far ProLiant BladeSystem servers



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Operoting environment for HP SSDs

HP server disk drives are available in three levels based an perfarmance: Entry, Midline, and Enterprise. The HP salid state drives intraduced in September 2008 represent a level af perfarmance, reliability, and capacity raughly equivalent ta Midline server disk drives. Mare impartantly, hawever, HP server SSDs can deliver this level af reliability in aperating enviranments that are unsuitable far traditianal disk drives (Table 1-1).

Table 1-1. SSD operating envelope

	HP server SSD
Operating Temperature	0°-70° C
Operating Shock	1500 g (.5 ms half sine wave)
Vibration	20 g (peak)10 – 2000 Hz
Power Consumption (Active)	Under 2 watts

HP SSD Futures

The HP server SSDs intraduced in late 2008 represent the first generatian af SSDs far PraLiant servers. In the first half af 2009, HP expects ta intraduce hat-plug SSDs using standard drive carriers. These drives will be supparted acrass the PraLiant praduct line.

As is already the case with hard disk drives, HP is warking ta develap separate classes af SSDs, each designed ta meet the specific capacity, perfarmance and reliability requirements far particular applicatians. Table 2-1 summarizes the current gaals far creating Entry, Midline, and Enterprise SSDs in the future as the technalagy cantinues ta evalve.

Table 1-2. Current goals for classes of HP server SSDs

	Entry / Midline	Enterprise
Interface	3 Gb/s SATA	6 Gb/s SAS dual port
Reliability	Optimized for constrained workloads	Optimized for 100% workloads
Latency	<1 ms for 512 byte random writes	<100 us for 512 byte random writes
Maximum capacity	2 times Enterprise SSD	Equal to SFF15K SAS disk drives
Other features	Full memory path error detection Always on write cache with hot removal protection	Full memory path error detection Always on write cache with hot removal protection
Power Consumption (Active)	Under 2 watts	2 – 9 watts

Additionol resources

Far additianal infarmatian an the tapics discussed in this article, visit:

Resource	URL
HP Solid State Storage	www.hp.cam/ga/salidstate
"Solid state drive technology for ProLiant servers" technology brief	http://h20000.www2.hp.cam/bc/dacs/suppart/SuppartManual/c01580706/c01580706.pdf
HP ProLiant drives (including solid state drives)	www.hp.cam/praducts/harddiskdrives

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Meet the Expert— Brian Purcell

Mark Brian Purcell is an HP hardware architect whose job is critically important to the success of AMD-based ProLiant servers. He is responsible for reviewing the future chipset and processor offerings, and he works closely with vendors to evaluate how their products can best be integrated into all HP server products. He also provides feedback to vendors on what features are needed to ensure that HP products meet or exceed customer requirements and expectations. Scot Wurster, Brian's manager, adds "Brian is very willing to help anyone facing a problem. When presented [with] a challenge from marketing, the gears [start] turning in his head. He will come up with a solution to fit the customer's need—usually a couple of different ways to fulfill that need He has a positive 'can do' attitude, and he works very well with other people. He also works closely with AMD, providing product feedback to improve their products' reliability and performance.."

Brian successfully balances his work and personal life through hobbies such as golf, motorcycles, radio-controlled sailplanes, and coaching his son's (Colin) baseball team. But his most interesting hobby is playing trombone in the HP Houston Jazz Band. Brian has played in the Jazz Band since 1996. Brian's wife of 12 years, Sharon, plays saxophone and directs the band. They also play in their church orchestra. But there's more—Brian has two brothers (Mike and Bill) who also work for HP. Below are excerpts from an interview with Brian.

Name: Brion Purcell
Title: Hordwore Architect - Industry Stondord Servers, Technology Solutions Group
Years at HP: 14
University/Degree

- Texos A&M University, BS in Computer Engineering (Moy 1994)
- Engineering Scholors Progrom

U.S. Patents: 9

Why did you decide to become an engineer?

Brian: While growing up, my curiosity led me to disassemble electrical devices such as Walkmans, radios, etc. My father always told me, "If you break it, you'd better know how to fix it!" When I was eleven, we got our first computer. I quickly learned how to use it, and I developed my programming skills. At fourteen, I developed an algorithm to generate magic squares (in multiples of four). As computer programming became second nature to me, I decided that a blended degree in Electrical Engineering and Computer Science would be perfect!

What is your most interesting research?

Brian: Modifying and applying my father's principle into our system architectures. "If [it breaks], you'd better know [what went wrong and] how to fix it."

I am a huge proponent of embedding logic analyzer functionality within our CPLDs (complex programmable logic devices) to help engineering and service teams quickly determine the source of system behaviors and faults. As a normal part of our system validation and margin testing, we occasionally encounter power and/or thermal faults. It is often difficult or time-consuming to repeat the failure; thus, it is very important that we catch and log the failure on the first occurrence.

This is especially important when our servers have multiple PCAs,where each PCA has multiple, independent voltoge regulators. We have to be oble to indicate the exact foiling PCA or replaceable voltage regulator module. When we con identify the exoct component that failed, it improves customer satisfaction.

The embedded logic anolyzer functionolity has motured significontly over the past few product generations, ond it continues to be successfully employed by multiple plotforms ocross both the ISS ond Business Critical Solutions (BCS) server teams. The current orchitecture improves the foult detection copobilities ond provides o very detoiled system stotus "snapshot" at the time of foilure.

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How much customer input goes into the design of your products?

Brian: Customer feedback is very important to us because customers are more likely to purchase HP products if we can meet their requirements. I personally go through several design concepts before I finally settle on the top one or two design recommendations. Some of the questions I always ask are

- Is the solution mechanically friendly to the customer and service person?
- How can we improve the total customer value for the product, extend the server's lifetime, and lower the total cost of ownership?
- How can we "future proof" our product design and provide customers with an upgrade path as technology evolves across the lifetime of the platform.

As the server development model has evolved industry-wide, what adjustments has ISS engineering made to maintain technological leadership?

Brian: There has been a significant paradigm shift in the relationship between product development and how our engineers develop their technical and debugging skills. Prior to the prevalence of ODM (outsourced development model) or JDM (joint development model) product development, our engineering staff gained knowledge through continuous, hands-on experience. During the course of the product development cycle, engineers would naturally progress from fixing simple issues, to debugging basic problems, to understanding various hardware and software interactions, and then to debugging significantly complex issues. Today, the ODM/JDM partner is quite capable of fixing the less complex issues. This leaves HP engineers to debug a higher percentage of complex issues than before, which demands that they understand how all of the software and hardware pieces interact with each other.

The ODM/JDM model gives senior engineers more opportunities for one-on-one mentoring of younger engineers to strengthen their system architecture knowledge and debug skills. This gives younger engineers a deeper understanding of system architecture, and it helps them to continue developing innovative technologies for HP products.

Common SM CLP scripting commands for ProLiant server management

This is the last in a series of three articles that discuss common SM CLP (Server Management Command Line Protocol) scripting commands. Links to the previous articles are listed in "Additional resources" at the end of this article. SM CLP is one of the communication, or access, protocols that can be used with the Systems Management Architecture for Server Hardware (SMASH). This article discusses the SM CLP syntax and properties.

SM CLP is accessed using Secure Shell (SSH). SSH can be interactive (as in a shell) or it can execute in a "command" mode by processing a single command at a time suitable for scripting. The following examples use SSH command mode, using a Windows utility (plink) that provides SSH command line support. Plink and PuTTY executables, source code, and license terms are freely distributed on the web. Other SSH command line utilities should support this functionality in a similar manner.

The SM CLP organizes commands into different functions— targets, properties, and verbs.

- Targets refer to the grouping of related objects, such as the host server (system1) or iLO, the "management access point" (map1). Targets can be subdivided into smaller groups using a folder-style naming convention—all the subordinate targets are presented in the output from the "show" verb.
- Properties represent related attributes for the given target.
- Verbs represent the actions that can be taken on a given target and property.

The following examples specify user credentials on the command line. If user credentials are not specified, iLO 2 prompts for account credentials, interrupting the process. iLO 2 also supports SSH key-based authentication.

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Retrieve properties of the host system

The following exomple illustrotes how to retrieve the properties of the host system using the show system1 commond. Administrotors con occess specifics within system1 by oppending subordinote torgets, such os system1/firmwore1, to reference the host ROM version.

```
C:\Program Files\putty>plink -ssh -l admin -pw password ilo2system.corp.net show system1
show system1
status=0
status_tag=COMMAND COMPLETED


/system1
  Targets
    firmware1

<output abbreviated for readability>

  Properties
    name=ProLiant DL380 G5
    number=0005PBN153
    oemhp_server_name=Exchange_01
    enabledstate=disabled
    oemhp_powerreg=auto

<output abbreviated for readability>

  Verbs
    cd version exit show reset set start stop
```

Retrieve iLO properties

The following exomple shows how to retrieve the iLO properties (mop1 properties in CLP terminology) using the show mop1 commond.

```
C:\Program Files\putty>plink -ssh -l admin -pw password ilo2system.corp.net show map1
show map1
status=0
status_tag=COMMAND COMPLETED


/map1
  Targets
    firmware1
    accounts1

<output abbreviated for readability>

  Properties
    name=iLO 2 Advanced
    license=<license key>
  Verbs
       cd version exit show reset set oemhp_ping
```


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Additionol resources

Visit the fallawing websites far additianal infarmatian an the tapics discussed in this article:

Resource	URL
HP Integrated Lights-Out	www.hp.cam/ga/ila
DMTF SMASH information	www.dmtf.org/standards/mgmt/smash/
Common SM CLP scripting commands for ProLiant server management, Part 1	http://h20000.www2.hp.com/bc/docs/support/SupportManual/c01579481/c01579481.pdf
Common SM CLP scripting commands for ProLiant server management, Part 2	http://h20000.www2.hp.com/bc/docs/support/SupportManual/c01581852/c01581852.pdf

QuickTip — Using Fabric Manager software to configure switches

This QuikTip addresses licensing requirements, installatian, and dawnlaads far Fabric Manager (FM) saftware. This infarmatian applies ta Cisca MDS 95xx Fibre Channel Switches.

FM softwore license not olwoys necessory

Here are the facts abaut FM license requirements:

- A license is nat required ta install Fabric Manager Basic far the MDS.
- A license is anly applicable far Fabric Manager Enterprise.
- Fabric Manager is free saftware as lang as anly ane fabric is managed at a time. Because a fabric can have multiple switches, all af them may be managed withaut the FM Server Package license.

FM softwore instollotion

FM saftware can be installed using the CD that cames with the switch, ar it can be dawnlaaded fram the HP Web site. Here is the link ta the latest dawnlaadable Fabric Manager saftware (MDS Management CD) far Cisca switches: http://h20000.www2.hp.cam/bizsuppart/TechSuppart/SaftwareIndex.jsp?lang=en&cc=us&pradNameId=1849158&pradTypeId=12169&pradSeriesId=1849157&swLang=13&taskId=135&swEnvOID=54

Nate
When the install CD is used, it also installs postgresql as the DB for the FM server.

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Recently published industry standard server technology papers

Title	URL
"iSCSI technologies in HP ProLiant servers with multifunction network adapters" technology brief	http://h20000.www2.hp.com/bc/docs/support/SupportManual/c01600624/c01600624.pdf
"Solid state drive technology for ProLiant servers" technology brief	http://h20000.www2.hp.com/bc/docs/support/SupportManual/c01580706/c01580706.pdf
HP Flex-10 technology	http://h20000.www2.hp.com/bc/docs/support/SupportManual/c01608922/c01608922.pdf
"Implementing Microsoft Windows Small Business Server 2008 on HP ProLiant servers" integration note	http://h20000.www2.hp.com/bc/docs/support/SupportManual/c01479108/c01479108.pdf
"Serial Attached SCSI storage technology" technology brief	http://h20000.www2.hp.com/bc/docs/support/SupportManual/c01613420/c01613420.pdf
"HP VMWARE ESXi management environment" integration note	http://h20000.www2.hp.com/bc/docs/support/SupportManual/c01570108/c01570108.pdf

Industry standard server technical papers can be found at www.hp.com/servers/technology.

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